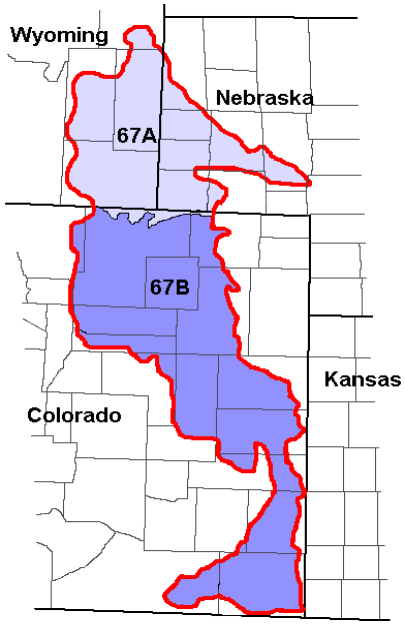
United States Department of Agriculture
Natural Resources Conservation Service

Ecological Site Description



Site Type: Rangeland

Site Name: Overflow

Site ID: R067BY036CO

Major Land Resource Area: 67B – Central High Plains, Southern Part

Physiographic Features

This site occurs on, or parallel to, intermittent or perennial waterways on the plains. These sites receive additional water from channel flooding and from runoff from surrounding areas. These areas are typically frequently or occasionally flooded.

Landform: drainageway, flood plain, draw

Aspect: N/A

	Minimum	Maximum
Elevation (feet):	3800	5600
Slope (percent):	0	3
Water Table Depth (inches):	60	60
Flooding:		
Frequency:	rare	frequent
Duration:	very brief	brief
Ponding:		
Depth (inches):	0	0
Frequency:	none	none
Duration:	none	none
Runoff Class:	low	medium

Climatic Features

The mean average annual precipitation varies from 12 to 16 inches per year depending on location and ranges from less than 8 inches to over 20 inches per year. Approximately 75 percent of the annual precipitation occurs during the growing season from mid-April to late-September. Snowfall can vary greatly from year to year but averages 35 to 45 inches per year. Winds are estimated to average about 9 miles per hour annually, ranging from 10 miles per hour during the spring to 9 miles per hour during late summer. Daytime winds are generally stronger than nighttime and occasional strong storms may bring periods of high winds with gusts to more than 90 miles per hour.

The average length of the growing season is 142 days, but varies from 129 to 154 days. The average date of first frost in the fall is September 28, and the last frost in the spring is about May 9. July is the hottest month and December and January are the coldest. It is not uncommon for the temperature to exceed 100 degrees F during the summer. Summer humidity is low and evaporation is high. The winters are characterized with frequent northerly winds, producing severe cold with temperatures dropping to -35 degrees F or lower.

Growth of native cool season plants begins about March 15 and continues to about June15. Native warm season plants begin growth about May 15 and continue to about August 15. Regrowth of cool season plants occurs in September and October of most years, depending on moisture.

	Minimum	Maximum
Frost-free period (days):	129	154
Freeze-free period (days):	151	178
Mean Annual Precipitation (inches):	12	16

Average Monthly Precipitation (inches) and Temperature (ºF):

	Precip. Min.	Precip. Max	Temp. Min.	Temp. Max.
January	0.32	0.36	12.0	45.1
February	0.26	0.38	15.9	50.9
March	0.83	0.87	22.3	58.9
April	1.28	1.38	30.1	69.1
May	2.32	2.49	39.9	78.0
June	1.93	2.57	49.0	88.7
July	1.42	2.31	55.0	93.9
August	1.07	2.38	53.5	91.9
September	1.02	1.40	43.8	83.8
October	0.89	1.00	32.5	72.9
November	0.52	0.53	20.9	57.4
December	0.34	0.37	11.9	46.9

Climate Stations		Period	
Station ID	**Location or Name**	**From**	**To**
CO0945	Briggsdale	1948	2000
CO4076	Holly	1918	2000
CO9147	Windsor	1948	1990

For local climate stations that may be more representative, refer to http://www.wcc.nrcs.usda.gov.

Influencing Water Features

Wetland Description:	**System**	**Subsystem**	**Class**	**Sub-class**
None	None	None	None	None

Stream Type: None

Representative Soil Features

The soils of this site are very deep, well drained and slowly to moderately permeable. These soils occur on drainageways, flood plains and draws. Some soils have gravel at depths below 40 inches. The available water capacity is typically moderate to high. These soils are typically occasionally or frequently flooded. The soil surface layer is typically 3 to 25 inches thick and is loam, clay loam, or silt loam. The soil moisture regime is aridic ustic. The soil temperature regime is mesic.

The Historic Climax Plant Community (HCPC) should exhibit slight to no evidence of rills, wind scoured areas or pedestaled plants. Water flow paths, if any, are broken, irregular in appearance or discontinuous with numerous debris dams or vegetative barriers. The soil surface is stable and intact. Sub-surface soil layers are non-restrictive to water movement and root penetration.

These soils are susceptible to wind and water erosion where vegetative cover is inadequate. Channel cutting, deposition, and removals may occur adjacent to streams.

Major soil series correlated to this ecological site include: Manzanst, Rago (occasional overflow), Paoli, Haverson, Sampson, Table Mountain, Goshen, and Lohmiller.

Other soil series that have been correlated to this site include: none

Parent Material Kind: alluvium
Parent Material Origin: mixed
Surface Texture: loam, clay loam, silt loam
Surface Texture Modifier: none

Subsurface Texture Group: loamy
Surface Fragments ≤ 3" (% Cover): 0
Surface Fragments > 3" (%Cover): 0
Subsurface Fragments ≤ 3" (% Volume): 0-20
Subsurface Fragments > 3" (% Volume): 0

	Minimum	Maximum
Drainage Class:	well	well
Permeability Class:	slow	moderate
Depth (inches):	80	80
Electrical Conductivity (mmhos/cm)*:	0	2
Sodium Absorption Ratio*:	0	0
Soil Reaction (1:1 Water)*:	6.6	8.4
Available Water Capacity (inches)*:	6	8
Calcium Carbonate Equivalent (percent)*:	0	15

*These attributes represent 0-40 inches in depth or to the first restrictive layer.

Plant Communities

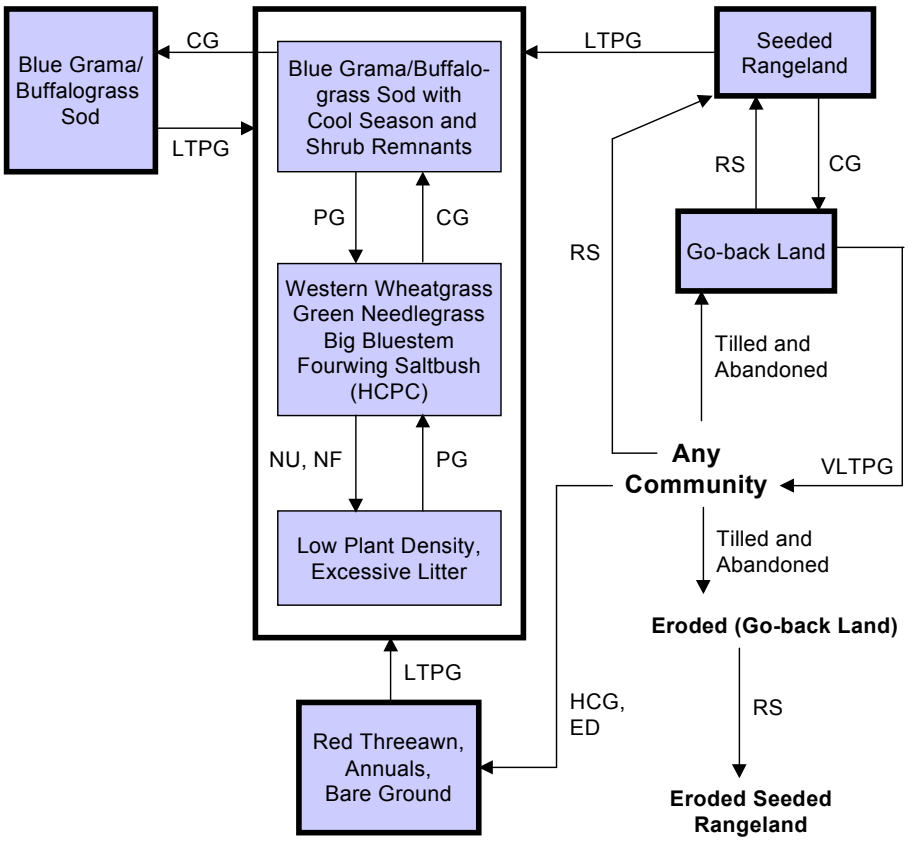
Ecological Dynamics of the Site:

Deterioration of this site, due to continuous grazing without adequate recovery periods following each grazing occurrence, will cause blue grama and buffalograss to increase. Major grass species such as western wheatgrass, green needlegrass, Canada wildrye, big bluestem, switchgrass and yellow Indiangrass will decrease in frequency and production as well as key shrubs such as fourwing saltbush and winterfat. American vetch and other highly palatable forbs will decrease also. Continuous grazing will eventually cause a buffalograss/blue grama sod to develop. Red threeawn, annuals and bare ground will increase with heavy continuous grazing or excessive defoliation. Plant communities subjected to a non-use status or lack of fire will cause excess litter to accumulate, reducing plant density. Much of this ecological site has been tilled and used for crop production.

The historic climax plant community (description follows the plant community diagram) has been determined by study of rangeland relic areas, areas protected from excessive disturbance, seasonal use pastures, short durationl/time controlled grazing and historical accounts.

The following diagram illustrates the common plant communities that can occur on the site and the transition pathways (arrows) among communities. Bold lines surrounding each plant community or communities represent ecological thresholds. The ecological processes are discussed in more detail in the plant community descriptions following the diagram.

Plant Communities and Transitional Pathways



CG - continuous grazing without adequate recovery opportunity, **ED** - excessive defoliation, **HCG** - heavy continuous grazing, **HCPC** - Historic Climax Plant Community, **LTCG** - long term continuous grazing (>40 yrs), **LTPG** - long term prescribed grazing (>40 yrs), **NF** - no fire, **NU** - non-use, **PG** - prescribed grazing with adequate recovery period, **RS** - range seeding, **VLTPG** - very long term prescribed grazing (>80 yrs)

Plant Community Composition and Group Annual Production

			Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush (HCPC)		
COMMON/GROUP NAME	**SCIENTIFIC NAME**	**SYMBOL**	**Group**	**lbs./acre**	**% Comp**
GRASSES & GRASS-LIKES			*1*	*1500 - 1800*	*75 - 90*
western wheatgrass	Pascopyrum smithii	PASM	1	700 - 800	35 - 40
green needlegrass	Nassella viridula	NAVI4	1	300 - 500	15 - 25
big bluestem	Andropogon gerardii	ANGE	1	200 - 400	10 - 20
switchgrass	Panicum virgatum	PAVI2	1	200 - 400	10 - 20
blue grama	Bouteloua gracilis	BOGR2	1	100 - 200	5 - 10
Indiangrass	Sorghastrum nutans	SONU2	1	100 - 200	5 - 10
Canada wildrye	Elymus canadensis	ELCA4	1	20 - 140	1 - 7
little bluestem	Schizachyrium scoparium	SCSC	1	20 - 100	1 - 5
buffalograss	Buchloe dactyloides	BUDA	1	20 - 60	1 - 3
sideoats grama	Bouteloua curtipendula	BOCU	1	0 - 100	0 - 5
slender wheatgrass	Elymus trachycaulus	ELTR7	1	0 - 100	0 - 5
needleandthread	Hesperostipa comata ssp. comata	HECOC8	1	0 - 20	0 - 1
prairie junegrass	Koeleria macrantha	KOMA	1	0 - 20	0 - 1
red threeawn	Aristida purpurea var. longiseta	ARPUL	1	0 - 20	0 - 1
sand dropseed	Sporobolus cryptandrus	SPCR	1	0 - 20	0 - 1
sixweeks fescue	Vulpia octoflora	VUOC	1	0 - 20	0 - 1
tall dropseed	Sporobolus compositus var. compositus	SPCOC2	1	0 - 20	0 - 1
sun sedge	Carex inops ssp. heliophila	CAINH2	1	20 - 40	1 - 2
other native grasses		2GP	1	20 - 100	1 - 5
FORBS			*2*	*100 - 200*	*5 - 10*
American vetch	Vicia americana	VIAM	2	20 - 40	1 - 2
rag sumpweed	Iva xanthifolia	IVXA	2	20 - 40	1 - 2
upright prairie coneflower	Ratibida columnifera	RACO3	2	20 - 40	1 - 2
Missouri goldenrod	Solidago missouriensis	SOMI2	2	0 - 40	0 - 2
curlycup gumweed	Grindelia squarrosa	GRSQ	2	0 - 20	0 - 1
false boneset	Brickellia eupatorioides	BREU	2	0 - 20	0 - 1
hairy goldaster	Heterotheca villosa	HEVI4	2	0 - 20	0 - 1
Louisiana sagewort	Artemisia ludoviciana	ARLU	2	0 - 20	0 - 1
Missouri milkvetch	Astragalus missouriensis	ASMI10	2	0 - 20	0 - 1
narrowleaf poisonvetch	Astragalus pectinatus	ASPE5	2	0 - 20	0 - 1
plains larkspur	Delphinium carolinianum ssp. virescens	DECAV2	2	0 - 20	0 - 1
prairie groundsel	Packera plattensis	PAPL12	2	0 - 20	0 - 1
purple prairieclover	Dalea purpurea var. purpurea	DAPUP	2	0 - 20	0 - 1
scarlet gaura	Gaura coccinea	GACO5	2	0 - 20	0 - 1
scarlet globemallow	Sphaeralcea coccinea	SPCO	2	0 - 20	0 - 1
slimflower scurfpea	Psoralidium tenuiflorum	PSTE5	2	0 - 20	0 - 1
western ragweed	Ambrosia psilostachya	AMPS	2	0 - 20	0 - 1
other native forbs		2FP	2	20 - 100	1 - 5
SHRUBS			*3*	*100 - 300*	*5 - 15*
fourwing saltbush	Atriplex canescens	ATCA2	3	100 - 300	5 - 15
winterfat	Krascheninnikovia lanata	KRLA2	3	20 - 100	1 - 5
fringed sagebrush	Artemisia frigida	ARFR4	3	0 - 20	0 - 1
green plume rabbitbrush	Ericameria nauseosa ssp. nauseosa var. glabrata	ERNAG	3	0 - 20	0 - 1
plains pricklypear	Opuntia polyacantha	OPPO	3	0 - 20	0 - 1
rubber rabbitbrush	Ericameria nauseosa ssp. nauseosa	ERNAN5	3	0 - 20	0 - 1
other native forbs		2SHRUB	3	20 - 60	1 - 3

Annual Production lbs./acre	LOW	RV*	HIGH
GRASSES & GRASS-LIKES	1050 -	1650	- 2250
FORBS	75 -	150	- 225
SHRUBS	75 -	200	- 325
TREES			
TOTAL	1200 -	2000	- 2800

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors. *RV - Representative Value.

Plant Community Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition table shown above has been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities will be determined by the decision makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush Plant Community

This is the interpretive plant community and is considered to be the Historic Climax Plant Community (HCPC). This community evolved with grazing by large herbivores and is well suited for grazing by domestic livestock and can be found on areas that are properly managed with prescribed grazing that allows for adequate recovery periods following each grazing event. The potential vegetation is about 75-90% grasses and grass-like plants, 5-10% forbs and 5-15% woody plants.

Major grasses include western wheatgrass, green needlegrass, big bluestem and switchgrass. Other grasses occurring on this community include blue grama, buffalograss, Canada wildrye and yellow Indiangrass. Major forbs and shrubs include American vetch, upright prairie coneflower, fourwing saltbush and winterfat.

This plant community is diverse, stable and productive. It is well suited to carbon sequestration, water yield, wildlife use by many species, livestock use and is esthetically pleasing. Community dynamics, nutrient cycle, water cycle and energy flow are functioning properly. Plant litter is properly distributed with very little movement off-site and natural plant mortality is very low. This community is resistant to many things except continuous grazing, plowing and/or development into urban or other uses.

Total annual production ranges from 1200 to 2800 pounds of air-dry vegetation per acre and will average 2000 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6701
Growth curve name: Cool season/warm season co-dominant; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	2	8	20	28	15	12	10	5	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events will shift this plant community to the *Blue grama/Buffalograss Sod with Cool Season and Shrub Remnants Plant Community.*
- Non-use and lack of fire will move this plant community to the *Low Plant Density, Excessive Litter Plant Community.*

- Prescribed grazing that allows for adequate recovery opportunity following each grazing event and proper stocking will maintain the *Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush Plant Community (HCPC).*

Blue Grama/Buffalograss Sod with Cool Season and Shrub Remnants Plant Community

This plant community evolved with continuous grazing without adequate recovery periods between each grazing event during the growing season. Recognition of this plant community will enable the land user to implement key management decisions before a significant ecological threshold is crossed.

Western wheatgrass, green needlegrass, fourwing saltbush and winterfat have been reduced to remnant amounts. Big bluestem, switchgrass, yellow Indiangrass, Canada wildrye and American vetch have been significantly reduced and may be missing from the plant community. Blue grama and buffalograss have increased in abundance, dominate the community, and are beginning to take on a sod appearance. Sand dropseed, red threeawn, sixweeks fescue, plains prickly pear and hairy goldaster have also increased. This plant community is at risk of losing key species that were present in the HCPC. Once these species are removed and other plants have increased, it will take a long time to bring them back by management alone. A substantial increase in financial investment will be required to replace the lost species in a shorter period of time.

Total aboveground carbon has been reduced due to decreases in forage and litter production. Reduction of rhizomatous wheatgrass, nitrogen fixing forbs, shrub component and increased warm season shortgrasses has begun to alter the biotic integrity of this community. Water and nutrient cycles are being impaired. This is an early stage of desertification.

Total annual production can vary from 400 to 1200 pounds of air-dry vegetation per acre and will average 800 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6702
Growth curve name: Warm season dominant, cool season sub-dominant; MLRA-67B, upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	2	15	45	20	15	3	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery periods between grazing events shifts this plant community across an ecological threshold toward the *Blue Grama/Buffalograss Sod Plant Community.*
- Prescribed grazing with adequate recovery periods after each grazing occurrence during the growing season with a proper stocking rate will return the plant community back to the *Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush Plant Community (HCPC)*.

Low Plant Density, Excessive Litter Plant Community

This plant community occurs when grazing is removed for long periods of time in the absence of fire. Plant composition is similar to the HCPC, however, in time, individual species production and frequency will be lower. Much of the nutrients are tied up in excessive litter. The semiarid environment and the absence of animal traffic to break down litter slows nutrient cycling. Aboveground litter also limits sunlight from reaching plant crowns. Many plants, especially bunchgrasses die off. Thick litter and absence of grazing or fire reduce seed germination and establishment. This plant community will change rapidly with prescribed grazing which allows animal impact and adequate recovery periods between grazing events.

In advanced stages, plant mortality can increase and erosion may eventually occur if bare ground increases. Once this happens, an ecological threshold has been crossed, and it will require increased energy input in terms of practice cost and management to bring back.

Total annual production can vary from 800 to 2200 pounds of air-dry vegetation per acre and will average 1500 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6703
Growth curve name: Cool season/warm season co-dominant, excess litter; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	10	20	25	15	15	10	5	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing with adequate recovery periods between each grazing event and proper stocking can bring this plant community back to the *HCPC*.

Blue Grama/Buffalograss Sod Plant Community

This plant community evolved with continuous grazing and occurs frequently throughout most of the eastern plains of Colorado. Most, if not all of the key grass, forb and shrub species are absent. Western wheatgrass may persist in trace amounts, greatly reduced in vigor and not readily seen. Blue grama and buffalograss dominate the community with a tight “sodbound” structure. Red threeawn, sand dropseed, sixweeks fescue and hairy goldaster have increased.

This plant community is resistant to change due to grazing tolerance of buffalograss and blue grama. A significant amount production and diversity has been lost when compared to the HCPC. Loss of cool and tall warm season grasses, shrub component and nitrogen fixing forbs have negatively impacted energy flow and nutrient cycling. Water infiltration is reduced significantly due to the massive shallow root system “root pan”, characteristic of blue grama and buffalograss. Soil loss may be obvious where flow paths are connected.

It will take a very long time to restore this plant community back to the HCPC with management. Renovation would be very costly. Desertification is advanced.

Production ranges from 200 to 900 pounds of air day vegetation per acre per year and averages 650 pounds.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6707
Growth curve name: Warm season dominant; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	3	20	45	20	10	2	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Heavy continuous grazing or excessive defoliation without adequate recovery periods following each grazing event will shift this plant community toward the *Red threeawn, Annuals, Bare Ground Plant Community.* This transition may take greater than 40 years. Erosion, loss of organic matter/carbon reserves and flooding are concerns.
- Long term prescribed grazing with adequate recovery periods following each grazing event and proper stocking over long periods of time will gradually move this plant community toward the *Blue Grama/Buffalograss Sod with Cool Season Remnants Plant Community* and eventually to the *Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush Plant Community (HCPC)* if a viable seed/vegetative source is still present. This process may take greater than 40 years.

Red Threeawn, Annuals, Bare Ground Plant Community

This plant community develops with heavy continuous grazing and/or occupation by prairie dogs. Red threeawn is the dominant species with sand dropseed present in lesser amounts. Blue grama may persist in localized areas. Introduced annuals such as kochia, Russian thistle, cocklebur and sunflower are present. Field bindweed can also be present , especially on prairie dog towns.

Litter levels are extremely low due to reduced production. Increased bare ground can cause erosion, off-site runoff and deposition when rainfall events are intense. The nutrient cycle, water cycle and overall energy flow are greatly impaired. Organic matter/carbon reserves are greatly reduced. Desertification is obvious.

Total annual production can vary from 0 to 200 pounds of air-dry vegetation per acre and will average 100 pounds during an average year.

The following is an estimated growth curve of this plant community expected during a normal year. Vegetative growth begins earlier in the southern reaches (Baca, Bent, Kiowa, Las Animas and Prowers counties) of MLRA-67B. Vegetative growth will typically be suppressed during the months of June through August in these counties due to higher evapotranspiration rates.

Growth curve number: CO6707
Growth curve name: Warm season dominant; MLRA-67B; upland fine textured soils.

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	3	20	45	20	10	2	0	0	0

(monthly percentages of total annual growth)

Transitions or pathways leading to other plant communities are as follows:

- Long term prescribed grazing with adequate recovery periods between each grazing event and proper stocking can eventually move this community back to the *Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush Plant Community (HCPC)* or associated successional plant communities, assuming an adequate seed/vegetative source is available. This transition may 40 to 80 years or more to achieve.

Go-back Land

Go-back land is created when the soil is tilled or farmed (sodbusted) and abandoned. All of the native plants are destroyed, soil organic mater is reduced, soil structure is changed and a plowpan or compacted layer is formed. Residual synthetic chemicals often remain from past farming operations and erosion processes are active.

Go-back land evolves through several plant communities beginning with an early annual plant community, which initiates the revegetation process. Plants such as Russian thistle, kochia and other annuals begin to establish. These plants give some protection from erosion and start to build minor levels of soil organic matter. This early annual plant community lasts for two to several years. Red threeawn, sand dropseed and several other early perennials can dominate the plant community for five to eight years or more. Buffalograss establishes next and dominates for many years. Eventually western wheatgrass, blue grama and other natives become reestablished.

Transitions or pathways leading to other plant communities are as follows:

- Very long term prescribed grazing that allows adequate recovery periods following each grazing event and proper stocking will eventually move the plant communities establishing on *Go-back Land* back to the *HCPC* or *Any Community*, assuming an adequate seed/vegetative source is available. This process takes many years (40-80 years or more).
- Range seeding followed with prescribed grazing can be used to establish and maintain the *Seeded Rangeland Plant Community.*

Go-back Land (eroded)

Eroded go-back land is created where tillage or farming and severe erosion has occurred. If the parent material that the original soil developed from is lost, then another ecosite will evolve. If the same parent material is present, then re-seeding or the slow process of developing soil and vegetation will start by similar processes as shown in the non-eroded *Go-back Land* above. This is a very slow process (100 years or more).

Seeded Rangeland

This plant community can vary considerably depending on how eroded the soil was, the species seeded, the stand that was established, how long ago the stand was established, and the management of the stand since establishment.

Transitions or pathways leading to other plant communities are as follows:

- Continuous grazing without adequate recovery period between grazing events can shift this plant community to a plant community resembling *Go-back Land.*
- Long term prescribed grazing with adequate recovery periods between grazing events will eventually move this plant community toward the *Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush Plant Community (HCPC)* or associated successional plant communities. This transition can take 40 years or more.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Western Wheatgrass, Green Needlegrass, Big Bluestem, Fourwing Saltbush Plant Community (HCPC)
The structural diversity in the plant community found on the HCPC is attractive to a number of wildlife species. Common bird species expected on the HCPC include Cassin's and Brewer's sparrow, chestnut collared longspur, lark bunting, western meadowlark, and ferruginous and Swainson's hawks. The combination of mid-tall grasses and shrubs provides habitat for greater and lesser prairie chicken in the eastern reaches of MLRA-67. Scaled quail may also use this community.

White-tailed and black-tailed jackrabbit, badger, pronghorn, coyote, swift fox, plains pocket gopher, long-tailed weasel, and several species of mice are mammals that commonly use this plant community. Reptiles using this community include western rattlesnake, bullsnake, plains garter snake western hognose snake, racer, western box turtle, and six-lined racerunner.

Blue Grama/Buffalograss Sod with Cool Season and Shrub Remnants Plant Community; Low Plant Density, Excessive Litter Plant Community; Blue Grama/Buffalograss Sod Plant Community; Threeawn, Annuals, Bare Ground Plant Community; and Go-back Land
The loss of taller grasses in these plant communities results in a shift of bird species away from the HCPC birds. Lark bunting, chestnut-collared longspur, western meadowlark, and Cassin's and Brewer's sparrow stop using these communities altogether. With the exception of the hawk species, most HCPC bird species would be only occasional users of these communities On sites with adequate drainage, typical shortgrass prairie species such as horned lark, killdeer, long-billed curlew, McCown's longspur, mountain plover, burrowing owl, black-tailed prairie dog, and ferruginous hawk are dominant species.

Jackrabbit, black-tailed prairie dog, thirteen-lined ground squirrel, and desert cottontail rabbit are frequent users of these communities. All other mammal species from the HCPC may use the community. Reptiles using these communities exclusively are short-horned lizard and lesser earless lizard. Other reptiles using these communities include the species listed for the HCPC.

Seeded Rangeland
The wildlife species expected on seeded rangeland would be those listed for the plant community the seeding most resembles.

Other Potential Species
The plains spadefoot is the only common species of frog or toad inhabiting grasslands in Eastern Colorado. This species requires water for breeding. Tiger salamanders may be found on grassland sites, but require a water body for breeding. Either of these species may be found in any plant community if seasonal water requirements are met. Mule and white-tailed deer may use this ecological site, however the shrub cover is too low to provide escape or hiding cover. On ecological site locations near riparian areas, deer will use the vegetation for feeding. Big brown bats will use any plant community on this ecological site if a building site is in the area. The gray wolf, black-footed ferret, and wild bison used this ecological site in historic times. The wolf and ferret are thought to be extirpated from Eastern Colorado. Bison are currently found only as domestic livestock.

Animal Preferences (Quarterly – 1,2,3,4†)

Common Name	Cattle	Sheep	Horses	Deer	Antelope	Bison	Elk
Grasses and Grass-likes							
big bluestem	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
blue grama	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D
buffalograss	D D P D	D D P D	D D P D	D D P D	D D P D	D D P D	D D P D
Canada wildrye	U D U U	N U N N	U D U U	N U N N	N U N N	U D U U	U D U U
green needlegrass	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D
Indiangrass	U D P D	U D U U	U D P D	U D U U	U D U U	U D P D	U D P D
little bluestem	U D P U	N D D N	U D P U	N D D N	N D D N	U D P U	U D P U
needleandthread	U P D D	N D N D	U P D D	N D N D	N D N D	U P D D	U P D D
prairie junegrass	U D U D	N D N U	U D U D	N D N U	N D N U	U D U D	U D U D
red threeawn	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
sand dropseed	U D U N	N U D N	U D U N	N U D N	N U D N	U D U N	U D U N
sideoats grama	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U	U D P U
sixweeks fescue	N D N N	N D N N	N D N N	N D N N	N D N N	N D N N	N D N N
slender wheatgrass	U P U U	N D U N	U P U U	N D U N	N D U N	U P U U	U P U U
switchgrass	U D D U	U D U U	U D D U	U D U U	U D U U	U D D U	U D D U
tall dropseed	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N	N U N N
western wheatgrass	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D
sun sedge	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D	U P D D
Forbs							
American vetch	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D	D P P D
curlycup gumweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	U U U U
false boneset	U U D U	N D U N	U U D U	N D U N	N D U N	U U D U	U U D U
hairy goldaster	U U D U	N N N N	U U D U	N N N N	N N N N	U U D U	U U D U
Louisiana sagewort	U U U U	U U D U	U U U U	U U D U	U U D U	U U U U	U U U U
Missouri goldenrod	U U D U	N U U N	U U D U	N U U N	N U U N	U U D U	U U D U
Missouri milkvetch	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U U U U
narrowleaf poisonvetch	U U U U	U D U U	U U U U	U D U U	U D U U	U U U U	U U U U
plains larkspur	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
prairie groundsel	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T	T T T T
purple prairie clover	U P P D	U P P U	U P P D	U P P U	U P P U	U P P D	U P P D
rag sumpweed	U U U U	N N N N	U U U U	N N N N	N N N N	U U U U	U U U U
scarlet gaura	U U D U	U D D U	U U D U	U D D U	U D D U	U U D U	U U D U
scarlet globemallow	U D D U	U P P U	U D D U	U P P U	U P P U	U D D U	U D D U
slimflower scurfpea	N N N N	N U U N	N N N N	N U U N	N U U N	N N N N	N N N N
upright prairie coneflower	U U D U	U P P U	U U D U	U P P U	U P P U	U U D U	U U D U
western ragweed	U D U U	U D U U	U D U U	U D U U	U D U U	U D U U	U D U U
Shrubs							
fourwing saltbush	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P	P D D P
fringed sagebrush	U N N U	U D D U	U N N U	U D D U	U D D U	U N N U	U N N U
plains pricklypear	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N	N N N N
rubber rabbitbrush	N N N D	D D D D	N N N D	D D D D	D D D D	N N N D	N N N D
winterfat	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P	P P P P

N = not used; **U** = undesirable; **D** = desirable; **P** = preferred; **T** = toxic
† Quarters: 1 – Jan., Feb., Mar.; 2 – Apr., May, Jun.; 3 – Jul., Aug., Sep.; 4 – Oct., Nov., Dec.

Animal Community – Grazing Interpretations

The following table lists suggested initial stocking rates for cattle under continuous grazing (year long grazing or growing season long grazing) under normal growing conditions however, *continuous grazing is not recommended.* These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using the following stocking rate information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity.

Plant Community	Production (lbs./acre)	Stocking Rate (AUM/acre)
W. Wheatgrass, Green Needlegrass, B. Grama, Big Bluestem (HCPC)	2000	0.64
Blue Grama/Buffalograss Sod w/Remnant Cool Seasons/Shrubs	800	0.26
Blue Grama/Buffalograss Sod	650	0.21
Low Plant Density, Excessive Litter	*	*
Red Threeawn, Annuals, Bare Ground	*	*

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangelands in this area provide yearlong forage under prescribed grazing for cattle, sheep, horses and other herbivores. During the dormant period, livestock may need supplementation based on reliable forage analysis.

* Highly variable; stocking rate needs to be determined on site.

Hydrology Functions

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B and D. Infiltration is moderate and runoff potential for this site varies from moderate to high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to NRCS Section 4, National Engineering Handbook (NEH-4) for runoff quantities and hydrologic curves).

Recreational Uses

This site provides hunting, hiking, photography, bird watching and other opportunities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors.

Wood Products

No appreciable wood products are present on the site.

Other Products

None noted.

Supporting Information

Associated Sites

(067BY002CO) – Loamy (formerly Loamy Plains)
(067BY008CO) – Loamy Slopes

Similar Sites

(067BY037CO) – Saline Overflow
[moderately saline, alkali sacaton occurs on this site]

Inventory Data References

Information presented here has been derived from NRCS clipping data, numerous ocular estimates and other inventory data. Field observations from experienced range trained personnel were used extensively to develop this ecological site description. Specific data information is contained in individual landowner/user case files and other files located in county NRCS field offices.

Those involved in developing this site include: Harvey Sprock, Rangeland Management Specialist, NRCS; Ben Berlinger, Rangeland Management Specialist, NRCS; James Borchert, Soil Scientist, NRCS; Terri Skadeland, Biologist, NRCS.

State Correlation

This site is specific to Colorado.

Field Offices

Akron, Brighton, Burlington, Byers, Cheyenne Wells, Eads, Flagler, Fort Collins, Fort Morgan, Greeley, Holly, Hugo, Kiowa, Lakewood, Lamar, Longmont, Simla, Springfield, Sterling

Other References

High Plains Regional Climate Center, University of Nebraska, 830728 Chase Hall, Lincoln, NE 68583-0728. (http://hpccsun.unl.edu)

USDA, NRCS. National Water and Climate Center, 101 SW Main, Suite 1600, Portland, OR 97204-3224. (http://wcc.nrcs.usda.gov)

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Site Description Approval

/s/ 03/25/2004

State Range Management Specialist Date